Scrutiny of antimicrobial use in racing horses with allergic small airway inflammatory disease

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Abstract — Antimicrobials had been administered to 38/55 (69%) racing standardbred and Thoroughbred horses with poor performance, subsequently diagnosed with nonseptic inflammatory airway disease. Horses with cough were more commonly treated ($P = 0.02$). In almost all cases, no clinical signs suggested that bacterial infection was present. Inappropriate use of antimicrobials was common.

Résumé — Examen minutieux de l'utilisation d'agents antimicrobiens chez les chevaux de course souffrant de maladie inflammatoire allergique des petites voies aériennes. Des antimicrobiens ont été administrés à 38/55 (69 %) chevaux standardbreds et chevaux pur-sang affichant une piètre performance, diagnostiqués par la suite avec une maladie inflammatoire aseptique des voies respiratoires. Les chevaux présentant une toux étaient plus fréquemment traités ($P = 0{,}02$). Dans presque tous les cas, aucun signe clinique ne suggérait la présence d'une infection bactérienne. L'utilisation inappropriée des antimicrobiens était fréquente.

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Empirical use of antimicrobials is common in veterinary and human medicine. This is not necessarily inappropriate, if there is a reasonable likelihood of bacterial infection, or if the patient is at particular risk for developing a bacterial infection, and if reasonable therapeutic regimens are chosen. However, empirical use of antimicrobials can lead to excessive antimicrobial use, if proper scrutiny is not applied. Inappropriate and excessive use of antimicrobials is an important topic in both veterinary and human medicine, and antimicrobial use in veterinary medicine is coming under increased scrutiny in Canada and abroad. Currently, legislative bodies have not intervened to restrict the use of antimicrobials in equine medicine; however, as concerns over antimicrobial resistance in both animals and humans increase, there may be pressure to restrict antimicrobial use in companion animal species.

Antimicrobials are an essential treatment tool in veterinary medicine and restriction on antimicrobial use could have a serious impact on the practice of veterinary medicine and the welfare of animals. Self-policing by veterinary associations for the judicious and appropriate use of antimicrobials is critical to demonstrating that efforts are being undertaken to ensure the appropriate use of these drugs. Veterinary industry groups, such as the Canadian Veterinary Medical Association (CVMA) and the American Veterinary Medical Association (AVMA), have established guidelines for judicious antimicrobial use (1,2). Principles of judicious use include prescribing and administering antimicrobials only when bacterial infection is present or suspected, or when animals are at particular risk for infection; considering other therapeutic options prior to initiation of antimicrobial therapy; using narrow-spectrum drugs wherever possible; using appropriate doses for as short a time as reasonable; avoiding the use of combination therapy, unless there is evidence to demonstrate it is appropriate; and making treatment choices based on culture and sensitivity results.

In human medicine, studies have identified antimicrobials are overprescribed, particularly by general practitioners (3,4). Antimicrobial prescription and use patterns have been minimally investigated in veterinary medicine. However, anecdotal information collected during routine evaluation of racing horses presented to the Ontario Veterinary College Veterinary Teaching Hospital (OVC-VTH) has suggested that antimicrobials are widely used in racing horses with poor athletic performance but without information supportive of bacterial infection, particularly in horses diagnosed with nonseptic inflammatory airway disease (NSIAD), previously known as allergic small airway inflammatory disease.

The objective of this study was to evaluate the history of antimicrobial use in racing horses with poor performance caused by NSIAD.

The computerized medical record system used at the OVC-VTH was used to identify horses diagnosed with NSIAD via bronchoalveolar lavage between January 1, 2003, and July 17, 2004. Records were scrutinized, and those standardbred and Thoroughbred racing horses that presented with a complaint of poor performance were entered into the study. Horses with other concurrent diseases were excluded. Historical information was collected from the medical record. History of antimicrobial administration for treatment of the primary complaint of poor performance was recorded. The specific antimicrobial administered was recorded, whenever possible.

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Table 1. Antimicrobial administration in racing standardbred and Thoroughbred horses with nonseptic inflammatory airway disease (n = 55)

Clinical signs	Antimicrobials	No antimicrobials	P-value
Anorexia	1/38 (2.6%)	0/17	0.69
Fever	3/38 (7.9%)	1/17 (5.9%)	0.64
Depression	2/38 (5.3%)	0/17	0.47
Cough	16/22 (42.1%)	2/15 (11.8%)	0.02
Mucus in trachea	3/38 (21.1%)	1/17 (5.9%)	0.16
Leukocytosis	3/38 (7.9%)	0/17	0.32
Nasal discharge	17/38 (44.7%)	6/17 (35.3%)	0.36
No clinical signs[a]	8/30 (21.1%)	9/17 (52.9%)	0.02

[a]Beyond poor athletic performance

Additionally, clinical signs that were identified prior to presentation and those that would have been used to determine prereferral treatment were recorded. The association of clinical signs with the use of antimicrobials was evaluated by using Fisher's exact test. A P-value of < 0.05 was considered significant.

Fifty-five horses were enrolled: 48 (87%) standardbreds and 7 (13%) Thoroughbreds. Overall, 69% of horses had received antimicrobials for treatment of poor performance prior to referral. The specific antimicrobial(s) administered was reported in 27/38 (71%) cases and included trimethoprim-sulfa (n = 16), procaine penicillin (n = 11), gentamicin (n = 11), ceftiofur sodium (n = 6), metronidazole (n = 2), and oxytetracycline (n = 1). Fourteen of 27 (52%) horses had received more than 1 antimicrobial, while 5/27 (19%) had received 3 antimicrobials. The most common combination was penicillin and gentamicin (n = 7). Duration of treatment was reported for 6 horses and ranged from 5 to 20 d (mean 9.9 d). There was no significant difference between the frequency of antimicrobial therapy between breeds (P = 0.37). Comparisons between horses treated and not treated with antimicrobials are presented in Table 1. No horse treated with antimicrobials had been tested specifically to determine if a bacterial infection was present or to identify an etiologic agent.

Nonseptic inflammatory airway disease is a common condition in racing horses; it may be characterized clinically by decreased athletic performance, cough, and nasal discharge (5,6). Because NSIAD is an inflammatory, not an infectious, condition, antimicrobial therapy is not indicated. This study documented frequent inappropriate use of antimicrobials on racing horses with NSIAD. Use of antimicrobials in most if not all horses in this study would contravene the guidelines for prudent antimicrobial use published by the CVMA and the AVMA. That 21.1% of horses treated with antimicrobials had no abnormal clinical signs, apart from decreased athletic performance, let alone any indicators of an infectious disease, is of concern. Cough was the only clinical sign that was significantly associated with administration of antimicrobials; however, cough is a very nonspecific sign that can be present in respiratory disease with a range of etiologies (7). While the presence of 1 or more clinical abnormalities beyond poor performance was associated with antimicrobial treatment, only 5 (13%) horses that were treated with antimicrobials were reported to be pyrexic, anorexic, or depressed; signs more commonly associated with infectious respiratory tract disease. Even in horses with these signs, however, the use of antimicrobials would not necessarily be indicated because of the relative likelihood of a viral rather than a bacterial infection.

Trimethoprim-sulfa was the most commonly reported antimicrobial, perhaps because it can be administered orally. The oral route is easier in many cases and oral administration may be performed by nonveterinarians on racetracks where Ontario Racing Commission rules prohibit administration of injectable medications by nonveterinary personnel. Metronidazole was administered on the recommendation of a veterinarian for the treatment of exercise-induced pulmonary hemorrhage. This recommendation, which is not supported by any scientific evidence, is of concern.

Because this retrospective study was based on a review of medical records, some historical information may have been incorrect, either by failure of veterinary personnel to record all facets of the history or by failure of the horse owners or trainers to remember or disclose information. However, it is likely that the bias was towards underreporting of antimicrobial treatment; therefore, the proportion of horses receiving antimicrobial therapy may be even higher than the 69% that was reported here.

This study shows that greater scrutiny should be applied when determining whether antimicrobials are indicated in the treatment of horses with poor athletic performance. It is unclear whether veterinarians or owners and trainers made the decision to initiate antimicrobial therapy in these cases. Even in situations where stable personnel made the decision to administer antimicrobials, veterinarians must bear some responsibility because of their role as provider of large volumes antimicrobials for discretionary use by their clients. The onus is upon the veterinarian to restrict antimicrobial use to only those situations where it is indicated and to counsel horse owners and trainers about the likelihood of the problem in individual cases being due to bacterial infection. CVJ

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